Course Title

An Introduction to Robotics

Two Day Weekend Curriculum - Total 8 Hours

Synopsis

Robotics enable children to "do" mathematics and science rather than study them. Using motivational effects of robotics, this introductory module is designed to excite students about learning math, science and engineering concepts. Participants are introduced academic concepts in a context that makes sense to them. As they design, build and program an autonomous robot, participants are exposed to advance math, science and engineering concepts in a 'hands-on mind-on' inquiry-based format.

Children will be taught about the continuing evolution of Robotics in the real world and how it impacts their daily lives. Participants will use Lego Mindstorm™ to design and build a simple robot and control their robots using the ROBOLAB™ software. Subsequently, they will add sensors to the robots they have built and learn how to program it to sense and react with its surroundings.

Our teacher becomes the facilitator;introducing background information thus preparing students for investigations. Lessons are designed to introduce/reinforce math, science, and technology concepts. As lessons evolve, children begin to recognize the relevance of the academic concepts used as they are delivered accordingly.

Students

This course is designed primarily for children between 10 and 17 years old. Younger children who are computer literate may be included.

Course Content	Duration (HH:MM)
Day 1 - The Basics	**4:00**
Introduction	**0:10**
Brief Introduction to Robotics	
Hardware	**0:20**
Lego Components	
Standard Parts	
Specialty Parts	
The RCX	
Building your first robot - The RoboTank	
Software	**1:20**
RoboLab Programming Environment and Tutorial	
Investigation # 1	
Motor 1 - Forward	
Motor 2 - Forward and Backward	
Motor 3 - Point Turn	
Motor 4 - Modifier	
Motor 5 - Loops	
Motor & Gears	**0:50**
Introduction to Motor, Gears and Gear Ratio	
Investigation # 2	
Mechanics 1 - Gear and Speed	
Sensors	**1:20**
Introduction to Lego Touch and Light Sensors	
Building Touch Sensors	
Investigation # 3	
Touch Sensor 1 - Wait for Push	
Touch Sensor 2 - Wait for Let Go / Conditional	
Touch Sensor 3 - Bug Bot / Multi-tasking	
Building Light Sensors	
Investigation # 4	
Light Sensor 1 - Wait for Dark	
Light Sensor 2 - Wait for Light	
Light Sensor 3 - Line Tracker	

Course Content	Duration (HH:MM)
Day 2 - Design Challenges	**4:00**
Review of Day 1's Lessons	**0:15**
Design Ideas	**0:30**
Lego Constructopedia	
Mechanical design ideas	
Programming samples	
Challenge #1 - Easy	**1:00**
Introduction	
Team @Work	
Presentation	
Challenge #2 - Moderate	**2:00**
Introduction	
Team @Work	
Presentation	
Closing Review	**0:15**